Atty Docket No.: MFL-004
Atty: William R. Haulbrook, Ph.D.
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SHEET 1 OF 12 1/12 FIG. 1 **100 PROCESS INPUT** 104 PROCESS MODEL FLOW CHARACTERIZATION 106 i.e., v, P, T 108 TWO-PHASE MODEL 110 112 **AMORPHOUS** SEMI-CRYSTALLINE PHASE MODEL PHASE MODEL CRYSTALLIZATION KINETICS MODEL 114 MORPHOLOGICAL CHARACTERIZATION 116 i.e.,  $\alpha$ , c,  $\langle uu \rangle$ MATERIAL PROPERTY PREDICTION 118 i.e.,  $\eta(\alpha)$ ,  $\rho(\alpha)$ ,  $\upsilon(\alpha)$ ,  $\sigma$ ,  $\tau$ ,  $\lambda$ ,  $C_{ijkl}$ , G', G''120 LAST TIME STEP? NO YES 122 **OR (OPTIONALLY)** DONE **FURTHER MATERIAL** PROPERTY PREDICTION i.e.,  $C_{ijkl}$ , G', G'',

Title: Apparatus and Methods for Predicting Properties of

Processed Material Inventors: Zheng et al. Serial No.: Not yet assigned

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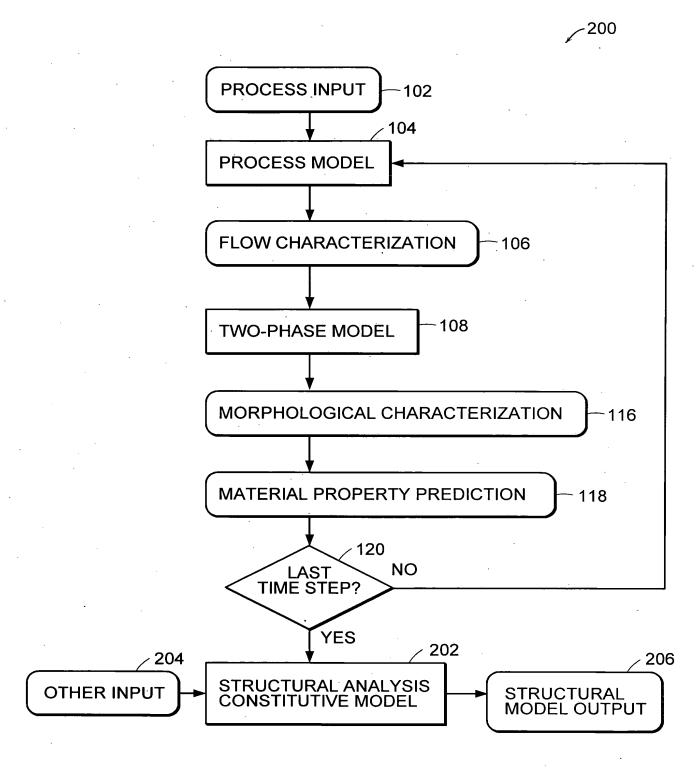


FIG. 2

Title: Apparatus and Methods for Predicting Properties of Processed Material Inventors: Zheng et al.
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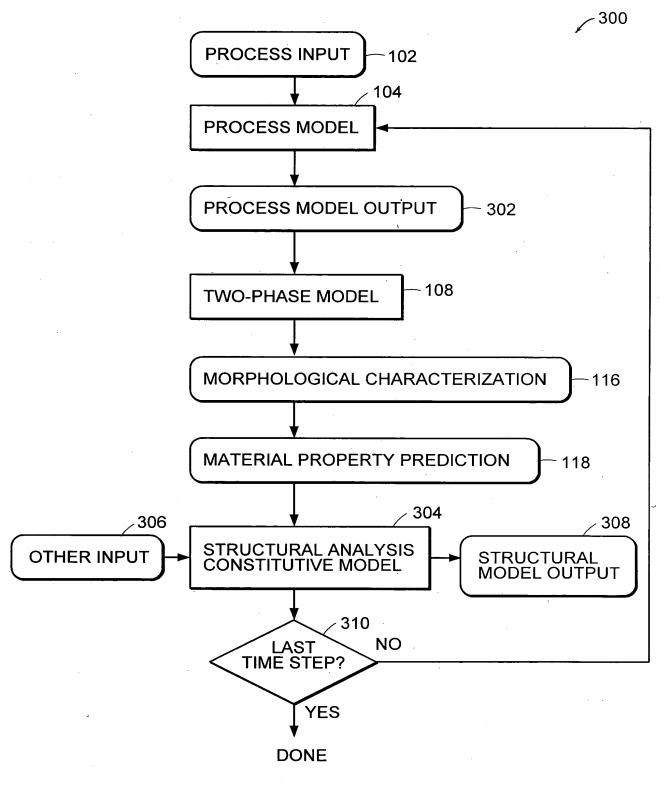


FIG. 3

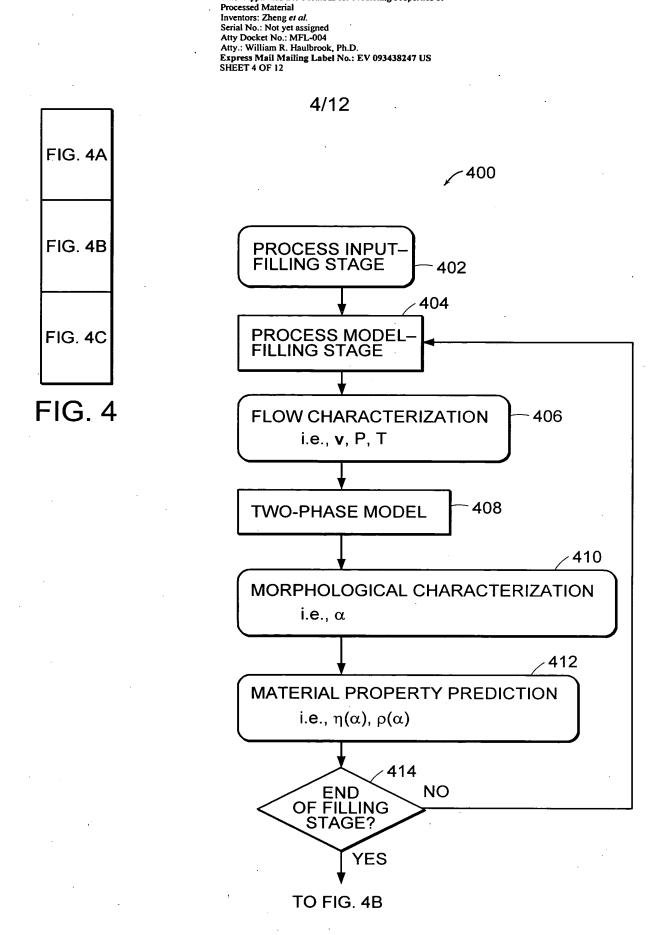


FIG. 4A

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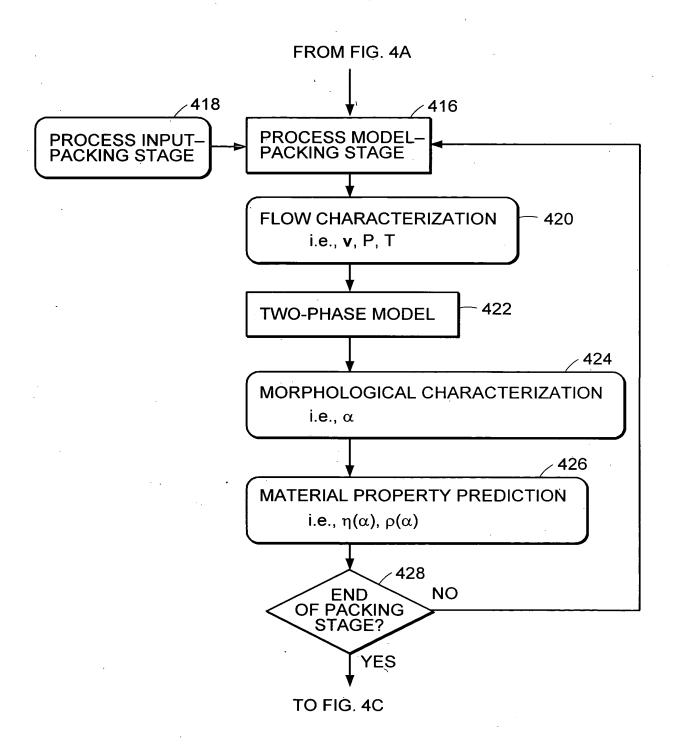
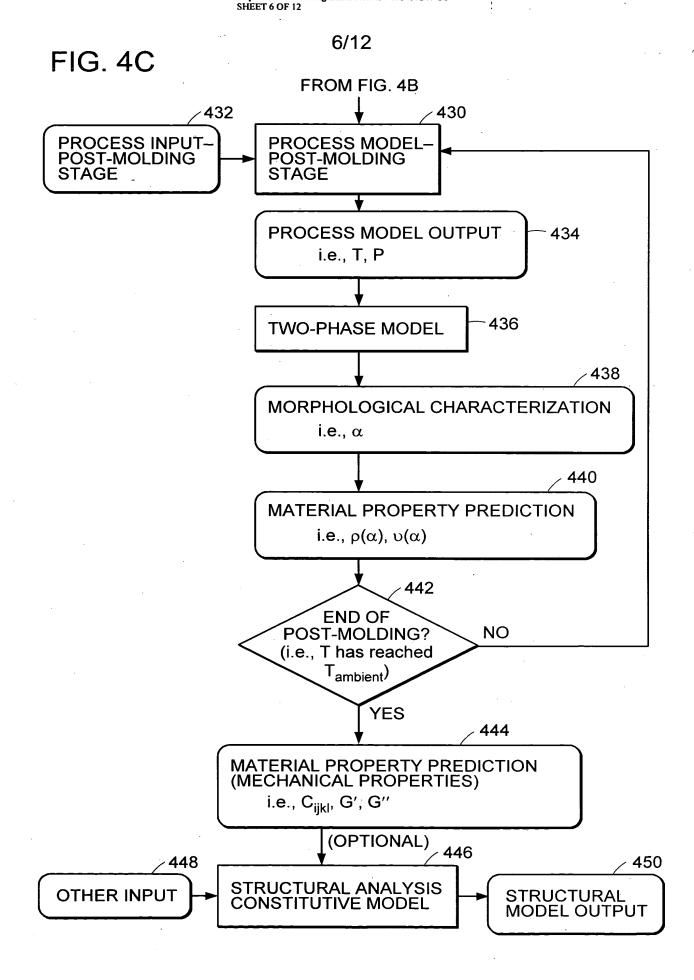


FIG. 4B

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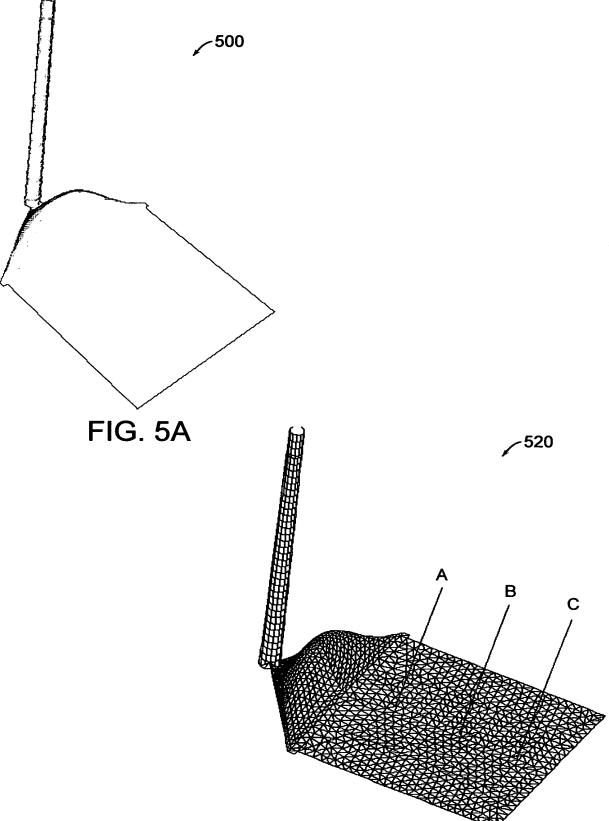


FIG. 5B

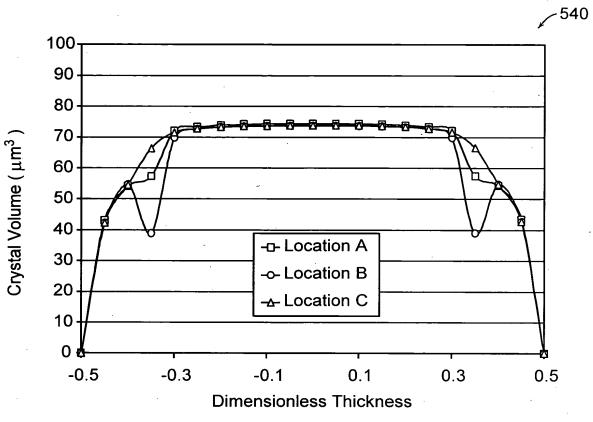
Title: Apparatus and Methods for Predicting Properties of Processed Material

Inventors: Zheng et al.
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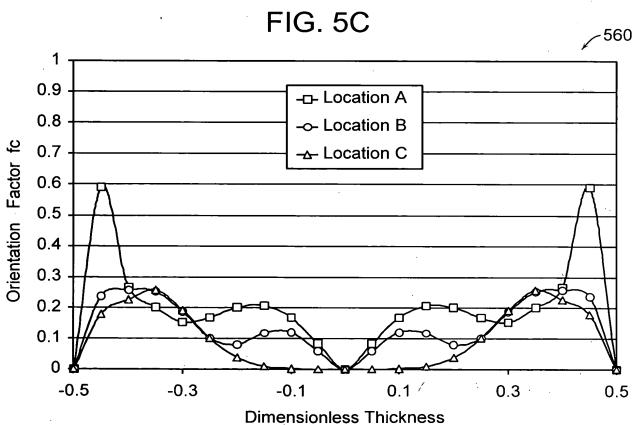


FIG. 5D

Processed Material Inventors: Zheng et al. Serial No.: Not yet assigned Atty Docket No.: MFL-004 Atty.: William R. Haulbrook, Ph.D.

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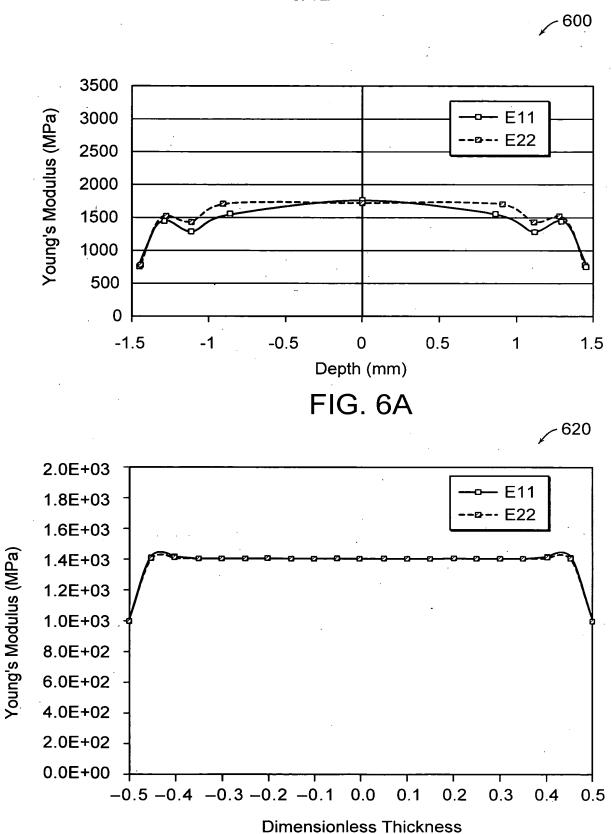


FIG. 6B

Processed Material
Inventors: Zheng et al.
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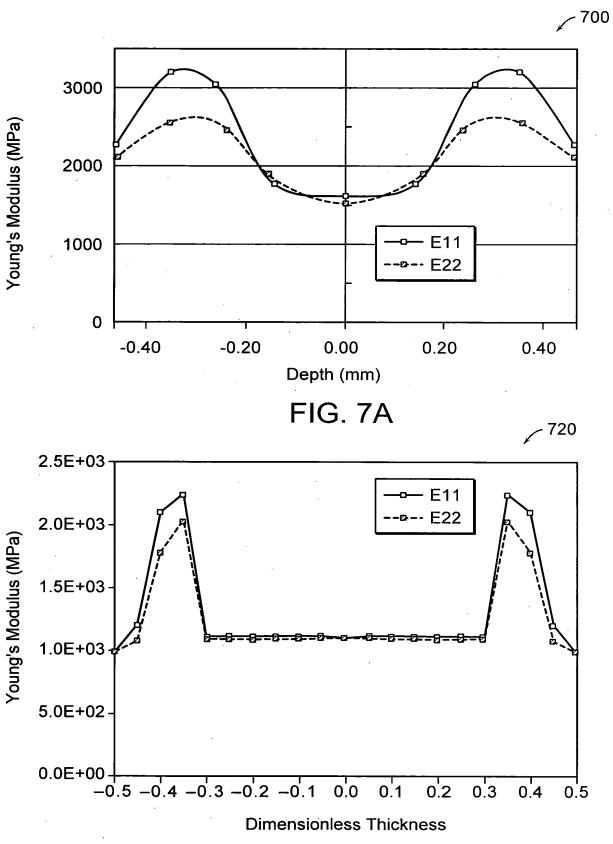
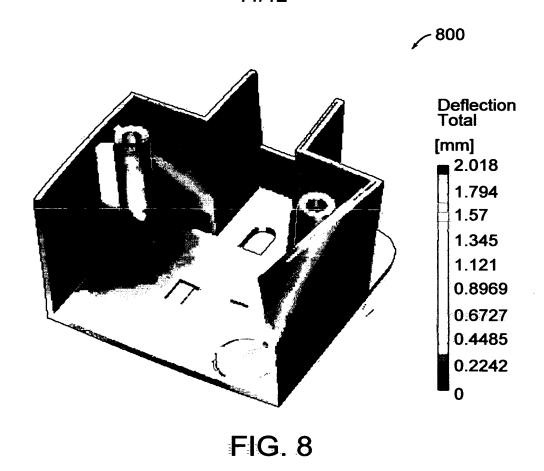


FIG. 7B

Processed Material
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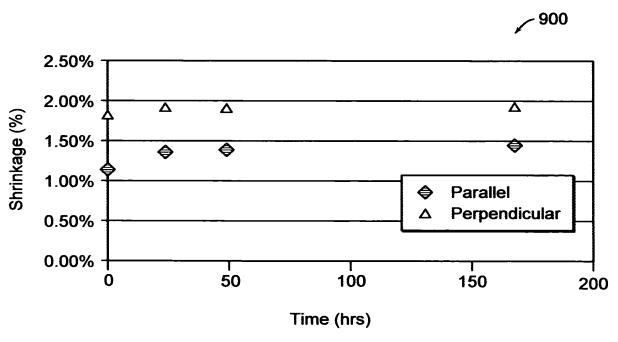


FIG. 9

Title: Apparatus and Methods for Predicting Properties of Processed Material Inventors: Zheng et al. Serial No.: Not yet assigned Atty Docket No.: MFL-004 Atty.: William R. Haulbrook, Ph.D. Express Mail Mailing Label No.: EV 093438247 US SHEET 12 OF 12

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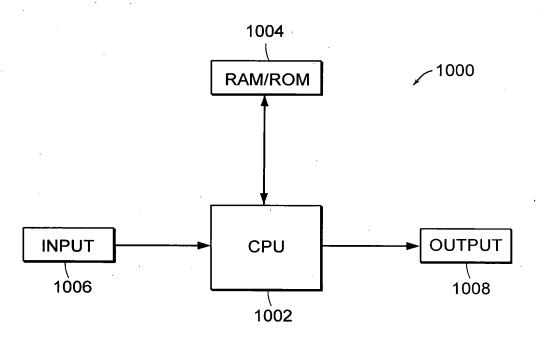


FIG. 10